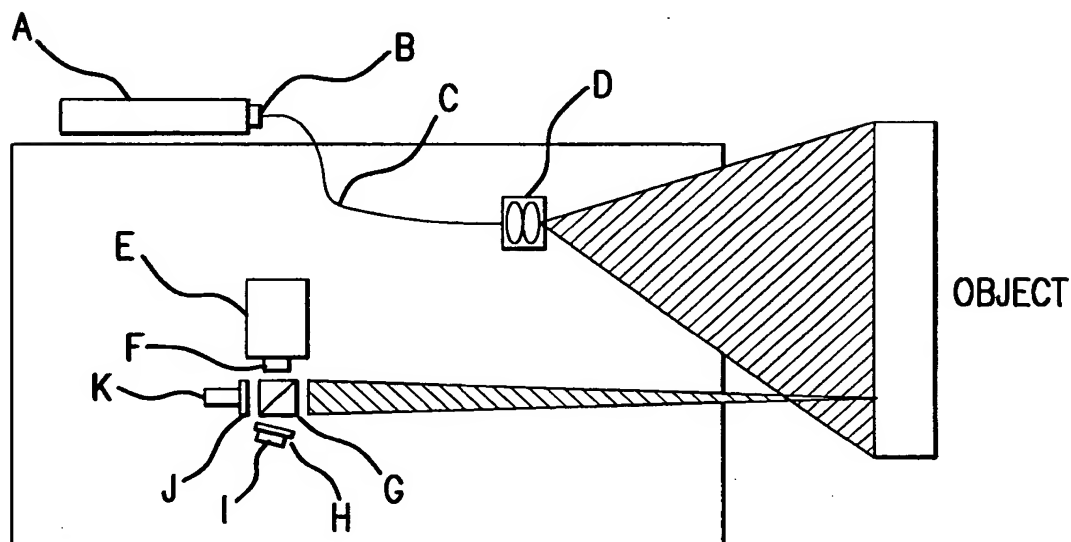


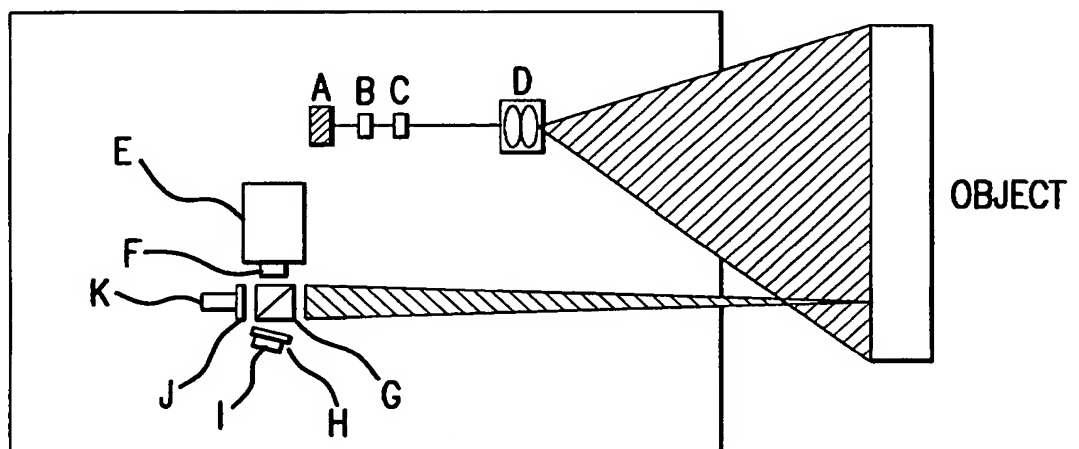
SCHEMATIC OF PHASE-STEPPING SHEAROGRAPHY HEAD
(SHEAROGRAPHY HEAD IS PORTION ENCLOSED BY BOX).



- A = COHERENT LASER SOURCE.
- B = ADJUSTABLE OPTICAL FIBER COUPLER.
- C = ARMORED SINGLE-MODE OR POLARIZATION MAINTAINING (PM) OPTICAL FIBER.
- D = DIVERGING OPTICS.
- E = CCD CAMERA (ANALOG OR DIGITAL).
- F = IMAGING LENS (SIMPLE OR COMPLEX).
- G = NONPOLARIZING BEAMSPLITTER CUBE.
- H = FRONT SILVERED MIRROR.
- I = ADJUSTABLE KINEMATIC MOUNT FOR H.
- J = FRONT SILVERED MIRROR.
- K = PZT DISK (LOW OR HIGH VOLTAGE VARIETY).

FIG.1

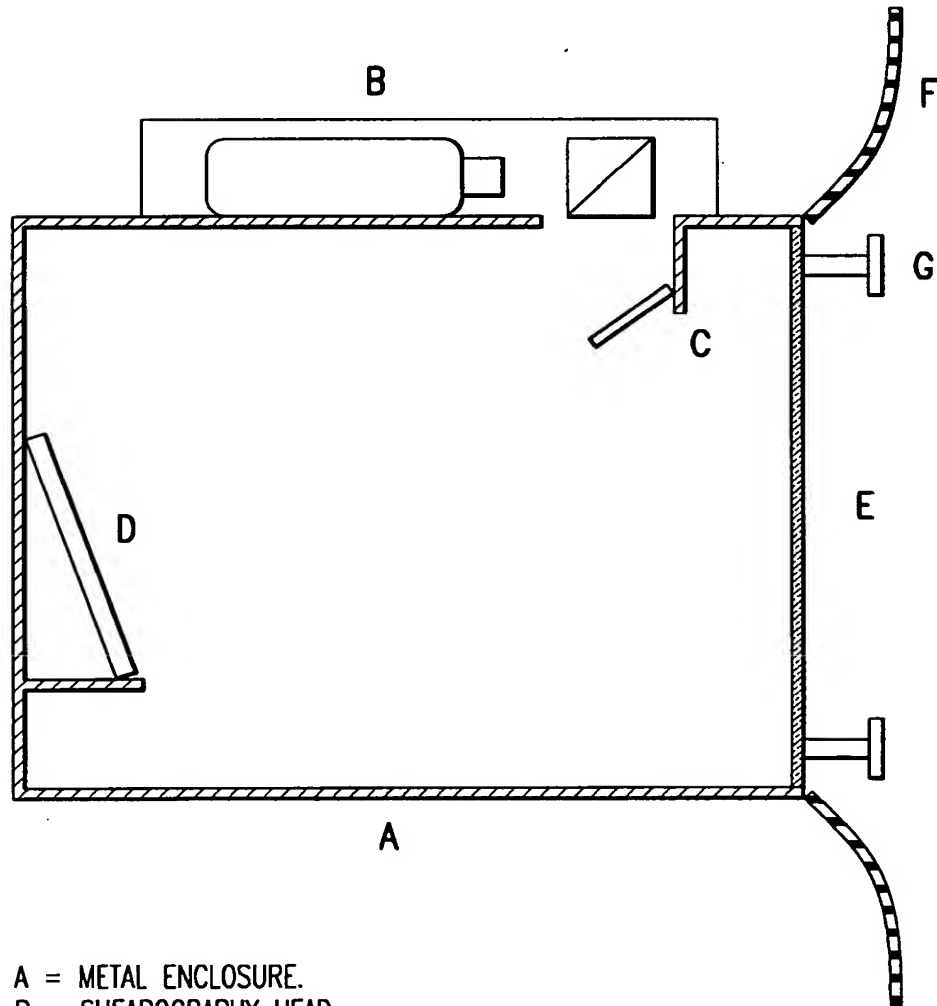
SCHEMATIC OF PHASE-STEPPING SHEAROGRAPHY HEAD WITH LASER DIODE SOURCE (SHEAROGRAPHY HEAD IS PORTION ENCLOSED BY BOX).



- A = COHERENT LASER DIODE SOURCE.
- B = BEAM SOURCE OPTICS.
- C = COLLIMATING OPTICS.
- D = DIVERGING OPTICS.
- E = CCD CAMERA (ANALOG OR DIGITAL).
- F = IMAGING LENS (SIMPLE OR COMPLEX).
- G = NONPOLARIZING BEAMSPLITTER CUBE.
- H = FRONT SILVERED MIRROR.
- I = ADJUSTABLE KINEMATIC MOUNT FOR H.
- J = FRONT SILVERED MIRROR.
- K = PZT DISK (LOW OR HIGH VOLTAGE VARIETY).

FIG.2

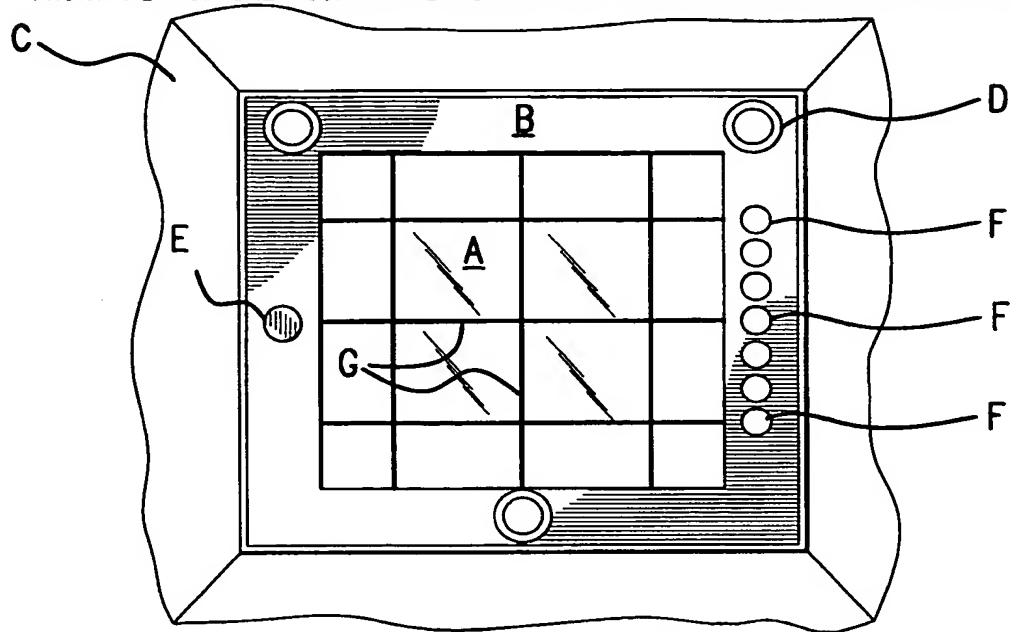
SIDE VIEW OF ENCLOSURE (SUBSYSTEM II) WITH SHEAROGRAPHY
HEAD (SUBSYSTEM I) MOUNTED ON TOP.



- A = METAL ENCLOSURE.
- B = SHEAROGRAPHY HEAD.
- C = SMALL MIRROR (PREFERABLY FRONT-SILVERED BUT NOT REQUIRED).
- D = BIG MIRROR (PREFERABLY FRONT-SILVERED BUT NOT REQUIRED).
- E = GLASS, LUCITE, OR PLEXIGLASS WINDOW.
- F = RUBBER FLAPS.
- G = STABILIZING FEET.

FIG.3

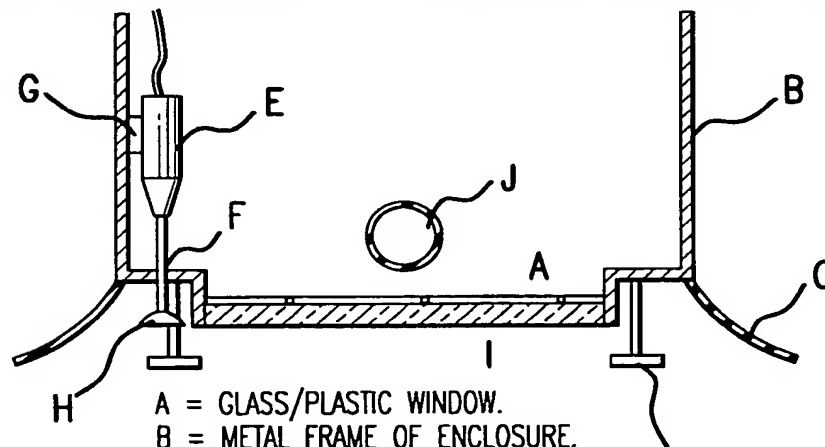
FRONT VIEW OF SHEAROGRAPHY ENCLOSURE WITH INTEGRATED EXCITATION MECHANISMS.



- A = GLASS/PLASTIC WINDOW.
- B = METAL FRAME OF ENCLOSURE.
- C = RUBBER FLAPS.
- D = PLASTIC STABILIZING FEET.
- E = PLUNGER ATTACHED TO SHAKER/STINGER.
- F = HOLES FOR VACUUM.
- G = GRID OF HEATING WIRES.

FIG.4

BOTTOM VIEW OF SHEAROGRAPHY WITH INTEGRATED EXCITATION MECHANISMS.



- A = GLASS/PLASTIC WINDOW.
- B = METAL FRAME OF ENCLOSURE.
- C = RUBBER FLAPS.
- D = PLASTIC STABILIZING FEET.
- E = SHAKER.
- F = STINGER.
- G = SHAKER MOUNTING.
- H = PLUNGER ATTACHED TO SHAKER/STINGER.
- I = GRID HEATING WIRES.
- J = OUTLET FOR VACUUM HOSE TO BE ATTACHED TO UNDERSIDE OF ENCLOSURE. (VACUUM HOLES CAN NOT BE SEEN IN THIS PERSPECTIVE.)

FIG.5

TIMING DIAGRAM FOR DATA ACQUISITION, TRANSFER CALCULATION, AND DISPLAY.

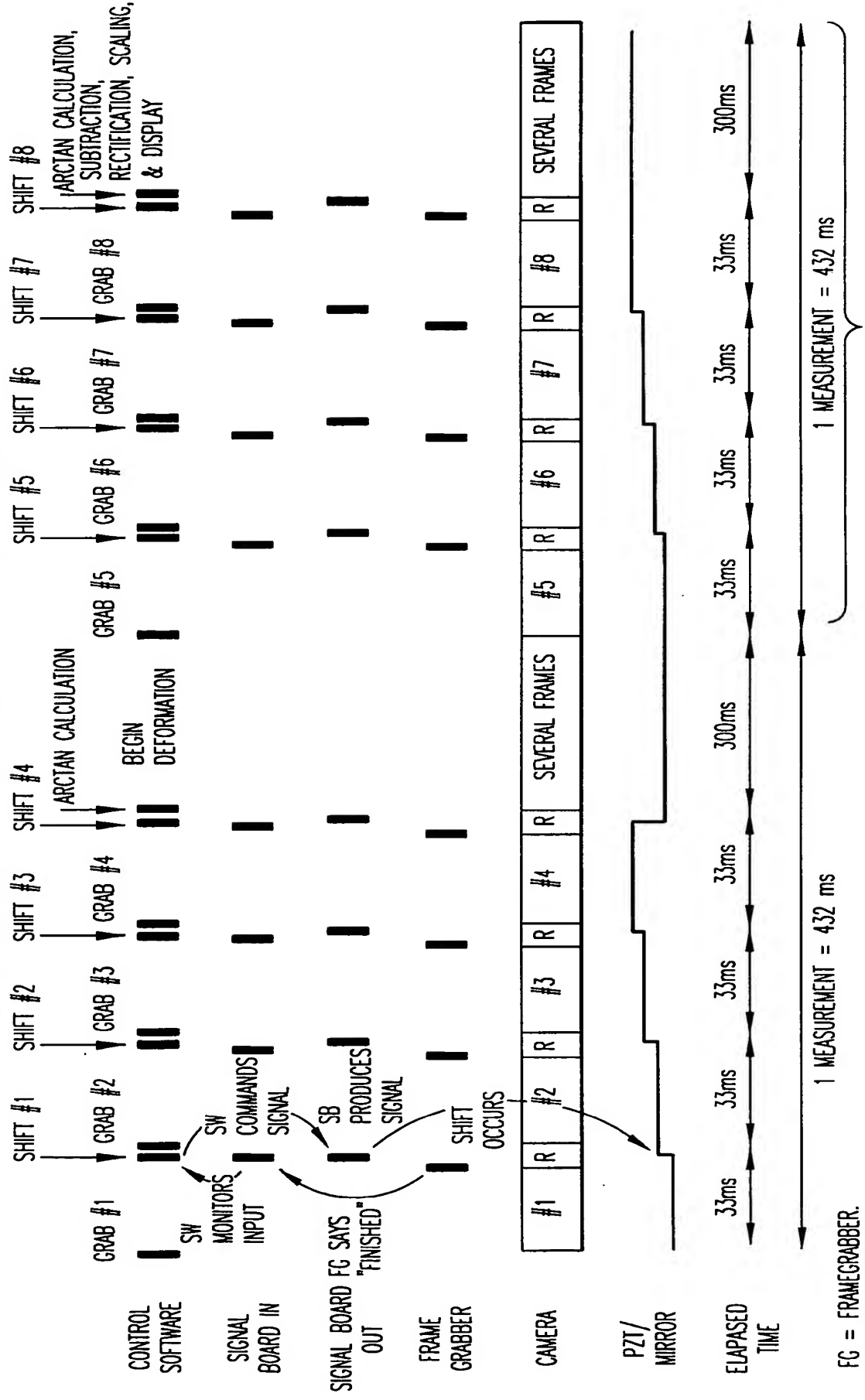
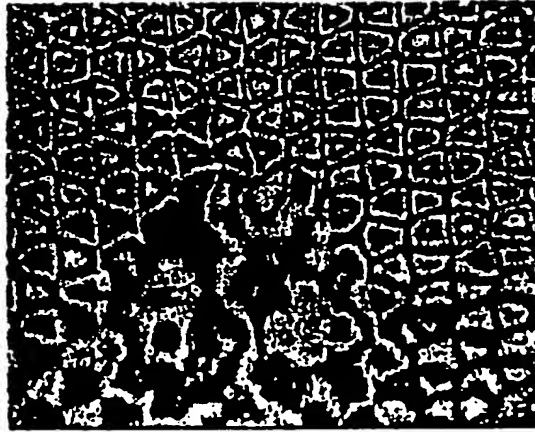
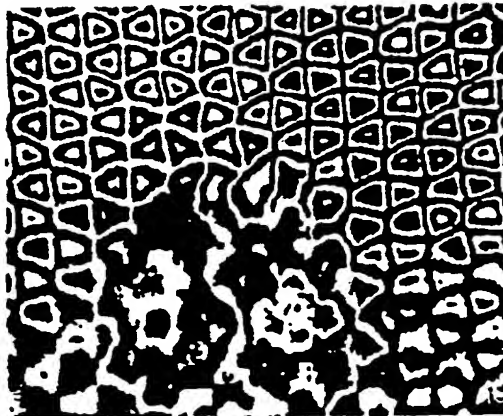


FIG. 6



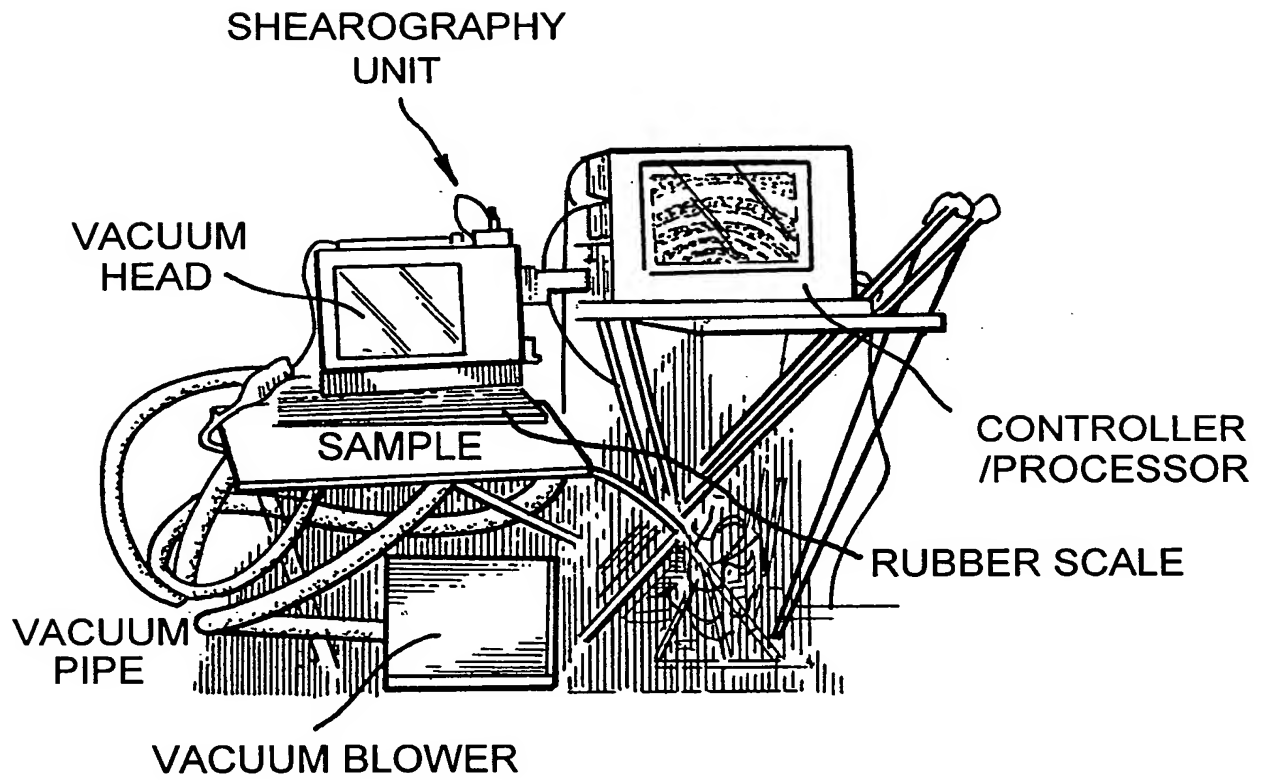
PHASE MAP OF THERMALLY DEFORMED HONEYCOMB
STRUCTURE, WITH NO SMOOTHING.

FIG.7



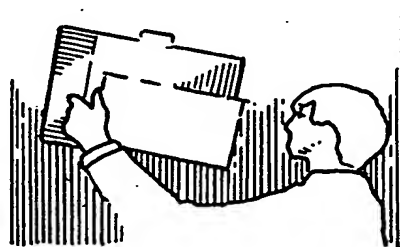
PHASE MAP OF THERMALLY DEFORMED HONEYCOMB
STRUCTURE, WITH NONLINEAR SMOOTHING.

FIG.8



PROTOTYPE PORTABLE REAL TIME HIGH RESOLUTION DIGITAL
PHASE STEPPING SHEAROGRAPHY SYSTEM

FIG.9



PORTABLE SHEAROGRAPHY HEAD (INCLUDES
OPTICAL SYSTEM AND VACUUM EXCITATION)
IN USE

FIG.10